

de leur ailes forme une sorte de pouche près du carpe" (should be elbow). "C'est ce qui avait fait nommer par Illiger *Saccopteryx*, celui de ces genres qui comprend les Taphiens."

J. E. GRAY.

ON THE OFFICINAL SPECIES OF PEPPER. By M. MIQUEL.

Miquel, like Jussieu, De Candolle and Endlicher, places the *Piperaceæ* among the Dicotyledons, as the embryo in germination exhibits two regular seed-lobes, which are uncommonly small, and so difficult to discover while the embryo in the ripe seed is enclosed in the permanent embryo-sac, half sunk in the apex of the albumen, that very recently this was regarded as the only cotyledon.

The *Piperaceæ* belong to the imperfect Dicotyledons, and stand best among Endlicher's *Iuliflores*, somewhere near the *Betulaceæ*, and in the vicinity of the *Urticaceæ*, with which indeed Jussieu united them. The family is evidently quite tropical, the species being dispersed universally over the torrid zone of the earth; the individuals are most abundant in the hot parts of America, and proportionally rare in tropical Africa. The American are almost all generically, or, with the exception of one truly cosmopolitan species, at least specifically different from those of the Old World.

Miquel divides the *Piperaceæ* into two tribes, the first of which, *Piperoniæ*, comprehends the herbaceous with axillary catkins, androgynous flowers and anthers one-celled in deliſcence. They are, with very few exceptions, American, and none are employed officinally.

The second tribe, *Pipereæ*, contains the shrubby and arborescent species. Their catkins are situated opposite the leaves; flowers mostly diœcious, the female exhibiting several distinct stigmas, the males with two-celled anthers. To the first division, characterized by permanent stipulæ and numerous sessile catkins, belong the genus *Pothomorphe*, Miq., of which many species, especially *Pothomorphe umbellata*, Miq., have pungent aromatic roots, which, under the name of Caapeba, are used in Brazil as stomachics and sudorifics.

The root of *Macropiper methysticum*, Miq., possesses similar qualities. It is used in the South Sea islands in the preparation of an intoxicating drink (highly pernicious in its effects), called Awa or Kawa, and has lately been made use of in medicine in England under the name of *Radix Awa*.

Of the true *Pipereæ*, which are separated from the preceding division by deciduous stipulæ and solitary catkins, two genera in this first volume are to be noticed here:—*Chavica*, Miq. and *Cubeba*, Miq.

I. Genus *Chavica*, Miq.—Flowers diœcious. Bracts of the male like those of the female catkins, shortly stalked, almost four-angled, shield-shaped. ♂ Stamens 2, with two-celled anthers. ♀ Style very short or wanting. In the latter case the 3–6 thick stigmas are immediately sessile on the ovate ovarium. The berries unite with the permanent bractæ and the thickened axis of the catkins into a fleshy fusiform fruit. Seeds longish or almost lenticular, with scaly,

finely-pitted testa. Albumen mealy, often horny at the outer part. Species all Asiatic.

Chavica Betle, Miq., and *Chavica Siriboa*, Miq., are frequently cultivated throughout the East Indies; their sharp aromatic leaves, with chalk and areca nuts, furnish the material for the habit of betel-chewing, universal in those countries.

The three following species are to be named as the plants furnishing the official *Piper longum*:—

1. *Chavica peepulooides*, Miq.—The younger branches, as well as the leaf- and flower-stalks, are clothed with fine hairs; the leaves smooth, membranous, and with transparent dots; the lower ovate, seven-nerved, rounded at the base, attenuated at the apex; the upper unequal, lanceolate, with an attenuated apex, five-nerved. Male catkins shortly stalked, slender, with circular bracts; the female also shortly stalked and cylindrical.

Synonym, *Piper peepulooides*, Roxb.

2. *Chavica Roxburghii*, Miq.—A forked-branched, trailing shrub, only erect during the flowering period, with stems at first finely hairy, afterwards smooth, and thick membranous leaves at first clothed with fine hair on the nerves, afterwards smooth, covered with fine transparent dots. The lower leaves have long stalks, are roundish, with broadly-cordate base; the upper are sessile, of a more elongated form, and with an unequally-cordate base embracing the stem. The male catkins filiform, cylindrical, with their stalk as long as the leaf; female scarcely half as long, but thicker than the male; the stems as long as the catkins.

Synonym, *Piper longum*, L. Z. Thl. Abbildg.; Nees, Plant. Medic., tab. 23.

This species, growing wild in damp thickets throughout the frontier of India and cultivated frequently in Bengal, yields like the preceding the *Piper longum* coming from the English colonies, which is gathered in January, and consists of the fruit-catkins dried in the sun. In India they use instead of these the roots and stem of the plant cut in small pieces.

3. *Chavica officinarum*, Miq.—A climbing shrub, with coriaceous leaves covered with fine transparent dots, smooth and paler below; the lower are longer-stalked, 3-5-nerved and ovato-cordate; the upper more shortly stalked, more elongated, with an unequal rounded or attenuated base and an attenuated apex. The stalks of the catkins are longer than the leaf-stalks. The female catkins are short and cylindrical, slenderer towards the apex.

Synonym, *Piper longum*, Rumph, Blume, Linn. in part.

This species grows wild in the Philippines, the Sunda Islands (perhaps also in Bengal), and is cultivated particularly in the island of Java, in the neighbourhood of the sea. It yields the *Piper longum* coming from the Dutch colonies. The dried catkins smell strongly aromatic, and have a sharp burning aromatic taste, stronger than black pepper. They are of a grayish-brown or grayish-cinnamon colour; their stalk is roundish, compressed, somewhat woody, curved, $1\frac{1}{2}$ centim. long, and almost smooth. They are thick, cylindrical,

somewhat attenuated towards the apex, obtuse, 2-4 centim. long, straight or slightly curved, 5-8 millimet. thick at the base, with an almost cylindrical axis, and faceted with a sort of net-work of the projecting apices of the berries. The berries are very thickly planted in spiral lines, so that about ten are always seen in a transverse section. The persistent bracts situated between the berries are shield-shaped, with compressed membranous-winged stalks, which adhere in some degree to the surrounding berries and to the coriaceous, round or roundly-triangular scutellum, which usually coheres very firmly with the three bracts enclosing it, and is of a blackish-brown colour, with a membranous, somewhat incurved border. The dried berries are about 2 millimet. long, obovate, and from the base to two-thirds of their height mostly five-angled through compression, as they are in contact with one another to that point. The remaining upper part projects out beyond the shields of the bracts, is smooth, compressed below, hemispherical, with an obtuse apex. The dried pericarp is thin, the seed about $1\frac{1}{2}$ millimet. long, obovate or rather spherical, somewhat angular beneath, and with an inconspicuous umbilicus; slightly pointed above. The testa or outer seed-membrane is crustaceous, black, shining, and under the lens presents groups of dots; the inner seed-membrane (*Endopleura*) is whitish; both adhere firmly, in the scarcely-ripe seed, to the cellular albumen, in the apex of which is imbedded the embryo, enclosed in the conico-circular embryo-sac.

II. Genus *Cubeba*, Miq.—Flowers diœcious. The male catkins are smaller, and have unstalked bracts overlapping one another, behind which stand 2-5 stamens, with ovate or reniform two-celled anthers. The bracts of the female catkins are almost sessile, roundly shield-shaped, often hairy beneath and persistent. Ovarium sessile, ovate, with 3-5 sessile, recurved, short stigmas. The berries are, from their contracted base, apparently stalked (*pseudo-pedicellate*). Fruit-membrane thin. Seeds roundish, with coriaceous or horny testa and mealy albumen.

Climbing shrubs from the East Indies and hotter parts of Africa. The female plant is often distinguished from the male by habit and the form of the leaf, but always by the catkins being thicker, and presenting at maturity an almost clustered appearance on account of the stalked berries.

Cubeba officinalis, Miq.—A climbing shrub with smooth leaves; the lower cordate at the base, ovate, and with a short point; the upper ovate, but more elongated, with a rounded base and smaller. Those of the male plant are 5-, those of the female 5-9 nerved. The catkins grow on stalks of the length of the leaf-stalks; the male are slender, the female thicker; the bracts coarsely hairy, the berries globular, and their stalks longer than themselves.

Synonyms, *Piper Cubeba*, Linn. fil., Blume, *Abbildung.*; Miquel, *Comment. Phytogr.*, tab. i. et ii.

This species, the only one furnishing the true cubebs, grows wild in Bantam, the west part of Java, as well as in the neighbouring small islands. It is cultivated now only in the lower parts of the

island of Java, whence an extraordinary quantity is annually exported.

The cubebs, the dried ripe fruit of this species, are globular, with a stalk (which is more properly the contracted base of the berry) thicker at the upper part, and exceeding them in length. Their colour is a sometimes brighter, sometimes duller, dark brownish-gray, with a grayish ring. Their surface is wrinkled as their succulent flesh shrinks into folds in drying, which form 20 or 30 regular 5-, 6- or more angled planes. The largest are about 5 millimet. in diameter; length of the stalks 5-8 millim., more rarely 1 centim. The seed adheres firmly to the dried flesh of the berry; its outer membrane (*testa*) is grayish-white; the inner (*Endopleura*) is shining, sometimes grayish or dull yellow, sometimes reddish. The *nucleus* is externally brownish or yellowish, internally whitish and comes into view on fracture, as the seed-membranes adhere closely to the fruit-membrane.

This cubeb-plant has very often been confounded with an allied species, namely—

Cubeba canina, Miq. = *Piper caninum*, Rumph., Blume; *Piper Cubeba*, Vahl; Nees, Plant. Med., tab. xxii. fig. 1. This is distinguished by its flexible, rooting stem, by its leaves being hairy beneath, the lower 5-nerved and somewhat unequally cordiform, while the upper or younger are 7-nerved and regularly cordate. The berries are more ovate than the genuine cubebs, somewhat pointed, and a little longer than their stalk.

This species grows in the Sunda Islands and the Moluccas. The figures 2, 4 and 5 of Nees's plate xxii. represent another species, erroneously taken for the plant yielding genuine cubebs; this Miquel calls *Cubeba costulata*. It is a native of the Mascarenhas Islands, and is easily distinguished by its lower, distant, soft-haired leaves, the midribs of which send off 10 nervures; by the stalks of the catkins, which are twice as long as the leaf-stalks, and lastly by the elongate-ovate fruit.

Cubeba borboniensis, Miq. = *Piper Cubeba*, Linn., is also an allied species. Cubebs have also been obtained lately from the Cape of Good Hope and Guinea. Miquel, however, holds that the plants furnishing both are specifically different from *Cubeba officinalis*, and calls the former *Cubeba capensis*, the latter *Cubeba Clusii* (= *Piper e Guinea*, Clusius). He believes that, besides the fruit of *Cubeba officinalis*, the very similar one of *Cubeba sumatrana*, and occasionally the two Indian species, named *C. Neesii* and *C. Wallichii*, are met with in commerce.—From Miquel's *Systema Piperacearum*.

OBITUARY.

Professor Graham of Edinburgh.—It is with sincere sorrow that we announce the death of this distinguished individual. The mournful event took place at Coldoch, in Perthshire, on the 7th of August, after a painful and protracted illness, which he bore with calmness and Christian fortitude.

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